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ORD-968-83
19 AUG 1983

MEMORANDUM FOR: Director of Training and Education, DDA

THROUGH : Deputy Director for Science & Technology

FROM : Philip K. Eckman
Director of Research and Development, DDS&T

SUBJECT : Proposal for Stanford University Academic Research Tour for ORD/Advanced Concepts Staff Officer

1. I am proposing a one year academic research tour as Visiting Scholar to the Stanford University Information Systems
STAT Laboratory for [redacted] to begin 1 November 1983. The proposed tour is an element in an ORD university selection process, the purpose of which is to increase Agency access to university research resources.

2. The Advanced Concepts Staff of ORD is tasked with the identification and introduction into Agency applications of far reaching - potentially high risk - new ideas that may significantly contribute to the fulfillment of the Agency's mission. Many such new ideas originate with researchers in academia. ORD has developed a number of programs to exploit this valuable resource. A Visiting Scholar lecture series, in which leading academic authorities expose diverse Agency audiences to current advanced research, is in its second year. A Resident Scholar program in which an academic researcher with staff clearances would work full time for a specified period, is under development.

3. Another program consists of academic research tours for staff officers. The staff officer actively participates in the research activities of a research group working in an area of Agency interest. I believe that three benefits accrue from this program. First, the staff officer sharpens his professional knowledge and skills. Second, persistent personal interaction with specialists affords much improved access to academic research and personalities of potential Agency interest than is possible through reading technical journals or attending

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professional meetings. Third, the Agency gains an improved opportunity to channel academic research activities into avenues of Agency interest.

4. [redacted] tour is the first proposed under the program. [redacted] is an applied mathematician specializing in signal processing. He has conducted a number of Agency sponsored seminars in various aspects of signal processing. Participating in these seminars have been leading experts from industry and academia. In addition, [redacted] has been responsible for supervising a number of Agency academic independent contractors who consult on a wide variety of Agency problems. He maintains an extensive network of contacts in academia, and is currently responsible for the ORD Visiting Scholar lecture series. He is currently pursuing his Ph.D. in mathematical statistics at George Washington University.

STAT STAT STAT

5. While at Stanford, [redacted] will concentrate on research in signal processing with a view, however, toward applications in all areas involving special purpose computation. A large number of research problems of interest to the Agency involve special purpose computation. These include problems in signal and image collection, processing and analysis, secure communications, and a variety of other areas. Because of the real time computational requirements of signal processing, research in this area is driving technological developments in computer science. The trend in computer technology is away from general purpose (typically Von Newman) computational devices and towards networks of distributed special purpose devices. Consequently, research problems of Agency interest requiring advanced computational technology can often be solved by applying developments in signal processing.

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6. The Information Systems Laboratory at Stanford University is a leading national center for research in signal processing. ISL is involved in research in advanced architectures for digital filters, spectrum analysis, general linear computational architectures, as well as the associated device physics and software algorithms. Much of this work is of potential interest to the Agency, if correctly identified and adapted.

7. Of particular interest is research in Fast Kalman and exact Least Squares adaptive signal interference and antenna beam steering estimation algorithms, systolic and CORDIC function array architectures for linear processors, residue and logarithmic arithmetic structures, and VLSI technology. The

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state-of-the-art and future prospects for these and other technologies will be defined and evaluated for possible Agency application.

8. It is my hope that [redacted] will be able to influence the direction of such research into avenues of interest to this and sister government agencies. By working side by side with leading researchers, [redacted] will attempt to foster an awareness and appreciation for the types of technology problems of generic interest to the government. To ensure no loss of classified information, Agency interests will be interlaced with those of other agencies such as Air Force Office of Scientific Research (AFOSR) and Office of Naval Research (ONR). STAT STAT

9. This program requires that [redacted] return to Washington periodically so as to ensure the necessary feedback and interaction between [redacted] and potential users of the research he identifies. This interaction will be achieved partly through seminars conducted by [redacted] in an Agency facility, and partly through one-on-one exchanges with other Agency staff. STAT STAT STAT

10. While at the ISL, [redacted] will continue to conduct seminars, and will pursue his own research interests in digital signal processor architectural design, including FFT algorithmic, lattice filter, and systolic array designs, and aspects of statistical estimation theory. Though with less emphasis, [redacted] will also keep abreast of research at Stanford in device physics as applied primarily to signal processing, artificial intelligence, and possibly other areas. Furthermore, he will maintain liaison with other government agencies, including ONR and AFOSR, and with research components of private industry on the West Coast. He will continue to be responsible for the Visiting Scholar lecture series. He has proposed that the Visiting Scholar for FY-84 be Thomas Kailath, Co-Chairman of the Department of Electrical Engineering at Stanford and former Director of the Information Systems Laboratory, and David Casasent, a Professor of Electrical Engineering at Carnegie-Mellon University. Kailath is an internationally known expert in digital signal processing, and Casasent in optical signal processing. STAT STAT

11. Inasmuch as the University will incur an overhead expense in the proposed tour for office supplies, secretarial, and other services, an estimated fee of approximately $6K will be required to cover this expense. This fee will be based on actual cost and will be billed by the Information Systems Laboratory on a quarterly basis. In addition, an estimated $2,500 will be required for travel expenses to and from Washington for an

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anticipated eight trips during the course of the one year tour. Finally, I propose that [redacted] receive one-half per diem for each day spent at Stanford, which would amount to approximately $14,000. ORD funds are available to cover these expenses. STAT

12. Finally, I expect that [redacted] will acquire an expert knowledge of a number of developing technologies of Agency interest. Furthermore, I anticipate that he will sustain his professional contact with academic and industrial experts past the conclusion of the proposed tour. Thus, the close professional collaboration developed during the course of this tour will hopefully pay dividends into the future. I recommend that this action be approved. STAT

[redacted] STAT

Attachment:
Form 136

CONCUR: [redacted] STAT

Deputy Director for Science & Technology — Date: 2 SEP 1983

APPROVED: [redacted] STAT

Director of Training & Education, DDA — Date: 9 SEP 1983

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REQUEST FOR TRAINING AT NON-AGENCY FACILITY

1. REQUEST NO. *(OTE use only)*

3. ENTER | 4. SOCIAL SECURITY NUMBER | 5. EMPLOYEE SERIAL NUMBER

14. TITLE OF COURSE

Stanford University Academic Research Tour

15. [illegible] FT

16. COURSE DATES

FROM Y M D	TO Y M D
83 11 01	

17. TRAINING FACILITY

Stanford University
Information Systems Laboratory

18. ESTIMATED COST	(OFFICE USE)	(OTE USE ONLY)
REGISTRATION/TUITION FEES	$	$
TRANSPORTATION		
PER DIEM		
OTHER		
TOTAL	$	$

19. LOCATION OF TRAINING

California

20. I CERTIFY FUNDS ARE AVAILABLE

OBLIG. REF. NO.

CHARGE PROJECT NO.

BUDGET OFFICER'S SIGNATURE | DATE

21. JUSTIFICATION *(Please read the instructions on the reverse side of the last copy before completing this item)*

1. ☐ 2. ☐ 3. ☐ 4. ☐ 5. ☐

22. DESCRIPTION OF COURSE

The Information Systems Laboratory at Stanford University is a leading national center for research in signal processing. ISL is involved in research in advanced architectures for digital filters, spectrum analysis, general linear computational architectures, as well as the associated device physics and software algorithms. Much of this work is of potential interest to the Agency, if correctly identified and adapted.

23. JOB RELATIONSHIP AND OBJECTIVE OF TRAINING

Staff officer will sharpen his professional knowledge and skills. Persistant personal interaction with specialists will afford better access to academic research and personalities of potential Agency interest than is possible through reading technical journals or attending professional meetings. See attached memorandum.

24. ADDITIONAL INFORMATION *(see instructions on reverse side of last copy)*

25. APPLICANT	YES	NO
A. HAS COVER		X
B. WILL USE COVER FOR THIS TRG		X
C. UNDISCLOSED PARTICIPATION		X

CENTRAL COVER STAFF USE ONLY

26. If I fail to complete this training, I understand I may be required to reimburse the Agency for the cost of the training. Upon completion of the training, I intend to continue my employment with the Agency. If required, I will also sign a Continued Service Agreement which obligates me to continue my employment for a specified period or repay the cost of training.

Training is Self-Initiated ☒ YES ☐ NO

27. FOR CCS *(Signature of C/CCS when undisclosed participation approved)* | DATE

DATE | 19 AUG 1 STAT

DATE | 19 AUG 1002 STAT

DATE

FORM 7-82 136 USE PREVIOUS EDITIONS

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